# Flight Validation of New Technologies & Dissemination Of Results

2nd New Millennium Program IPDT Forum

Group 2

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# Agenda

- Problem Statement
- Definition of Flight Validation
- Why Flight Validate?
- Who Are The Customers?
- Plan Development Process
- Plan Contents and Execution
- Dissemination and Recommendations

# Problem Statement

"Need to examine and ***define the contents of a detailed validation plan*** for DS1, DS2 and EO1* to include a recommended plan outline. In addition, they will examine and document the approach to data analysis and provide an ***initial set of guidelines as to how to handle the dissemination of the data*** once analysis is complete. The latter portion will have to be fleshed out at a later date."

***DS1, DS2, and EO1 are representative of all NMP Missions.**

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# Definition of Flight Validation

An Extra Terrestrial Demonstration Of A Yet Unproven Capability Against A Predetermined Set Of Metrics.

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# Why Flight Validate?

- Inability To Recreate A Collective Space Environment On Earth
  - e.g. Vacuum, Zero Gravity, Thermal Extremes & Cycles, Radiation, Real Time Life Cycle, ….
- Inability To Demonstrate/Confirm System Level Performance.
  - e.g. Zero Gravity Landing & Sampling, Kilometric Optical Gyro, Large Baseline Interferometers, ….
- Establish A Space Heritage For A Technology
- Space Flight Of A Technology May Enables Validation Of Related Technologies.

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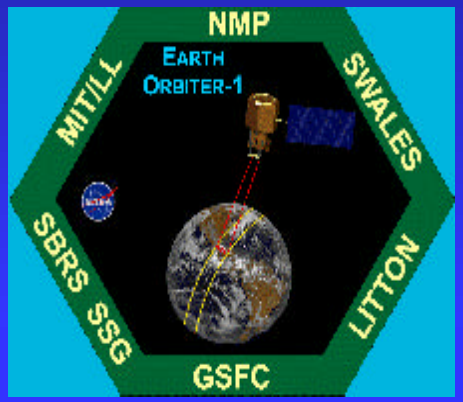
# Who Are The Customers?

- Scientists
  - Enable The Rapid Return Of A Rich Body Of Science
  - Establish Confidence In Flight Data
- Operational and Program Managers
  - Validation Results In Mitigation Of Cost, Schedule & Performance Risk Through Flight Heritage
- Technologists
  - Provides Real Application Feedback
  - Results Guide Future Plans

# Customers *continued*

- Congress & The Public
  - Validation Has The Potential To Increase ROI/ROA Due To Multimission Use Of Reliable Validated Technologies
  - Improved Perception Through Overall Science Results
  - Fertile Ground For Outreach
  - Added Value & Confidence In Space Program



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# Plan Development Process

- IPDT Members Are Responsible For Plans.
- Participation & Concurrence By Flight / Science Teams
- Development During Phase A/B, Finalized Prior to Phase C/D/E
- Iteration Occurs During Phases C/D/E

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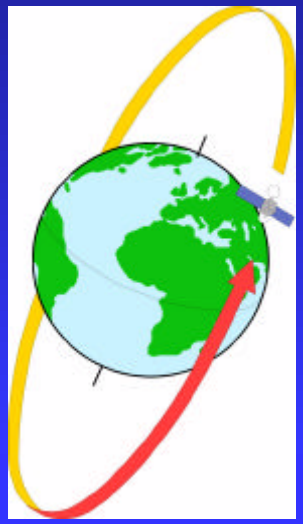
# Contents of Validation Plan

- Description Of The technology, Features & Benefits
- Objectives Of & Rationale For Flight Validation
- Critical Requirements That Necessitate The Technology
- Roles & responsibilities Of IPDT, Flight Team, Mission Ops, Science, Etc.
- Validation Metrics; Measures Of Success Based On Req’ts
- Step By Step Process For Validation
- Required Resources (Cost, Schedule, Equipment, Etc.)
- Impacts On Other Flight Systems (Vehicle, Payload, Comm)
- Description Of Expected Results And  Data Formats
- Dissemination
- IPDT, Flight & Science Team Sign Off

# Recommended Plan Outline

- **Introduction**
  - Description Of Technology
  - Validation Rationale & Objectives
  - Critical Technology Requirements
  - Roles & Responsibilities
- **Phase 1 - Preplan**
  - Metrics To Be Used In Validation
  - Types & Quantity Of Data Needed To Asses Results Against Metrics
  - Expected Results
- **Phase 2 - Development Plan**
  - Detailed Validation Procedure
  - Required Resources
  - External Interfaces
- **Phase 3 - Implementation Plan**
  - Acquisition, Formatting, & Delivery Of Data
- **Phase 4 - Analysis Plan**
- **Phase 5 - Dissemination**



# Plan Execution

- Responsibilities For Data Acquisition & Analysis:
  - IPDT & Flight Team Execute Plan
    - Flight Team Executes Validation Data Acquisition Plan Pre & Post Launch
    - IPDT Works With Flight & Science Teams To Analyze Data To Extract Validation Information

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# Dissemination

- Guidelines
  - Early Agreements on Terms and Conditions
    - Intellectual Property Rights Issues
    - Government Security Restrictions (Did Not Consider)
  - Coordinate With Partners & Showcase Industry/Government/University team
- Vehicles
  - NMP Conference Or Symposium
  - External Web Site
  - CD/DVD Distribution
  - Technical Publications / Star News
  - Final Report

# Summary Recommendations

- Establish A Standard Plan Format & Content Across All Technology Categories (Level Of Detail May Vary With Category)
- Identify Technology Users/Customers Early On And Get Them Involved.
- Develop & Implement The Plan Early In The Project Including All Associated Members
- Iterate The Plan For Continual Improvement & Rescoping
- Showcase The Ongoing Flight System Technologies. (e.g. Add Technology Description And Status Presentations To NMP Workshop Agendas.)

**Management Team Must Be Committed!!!**